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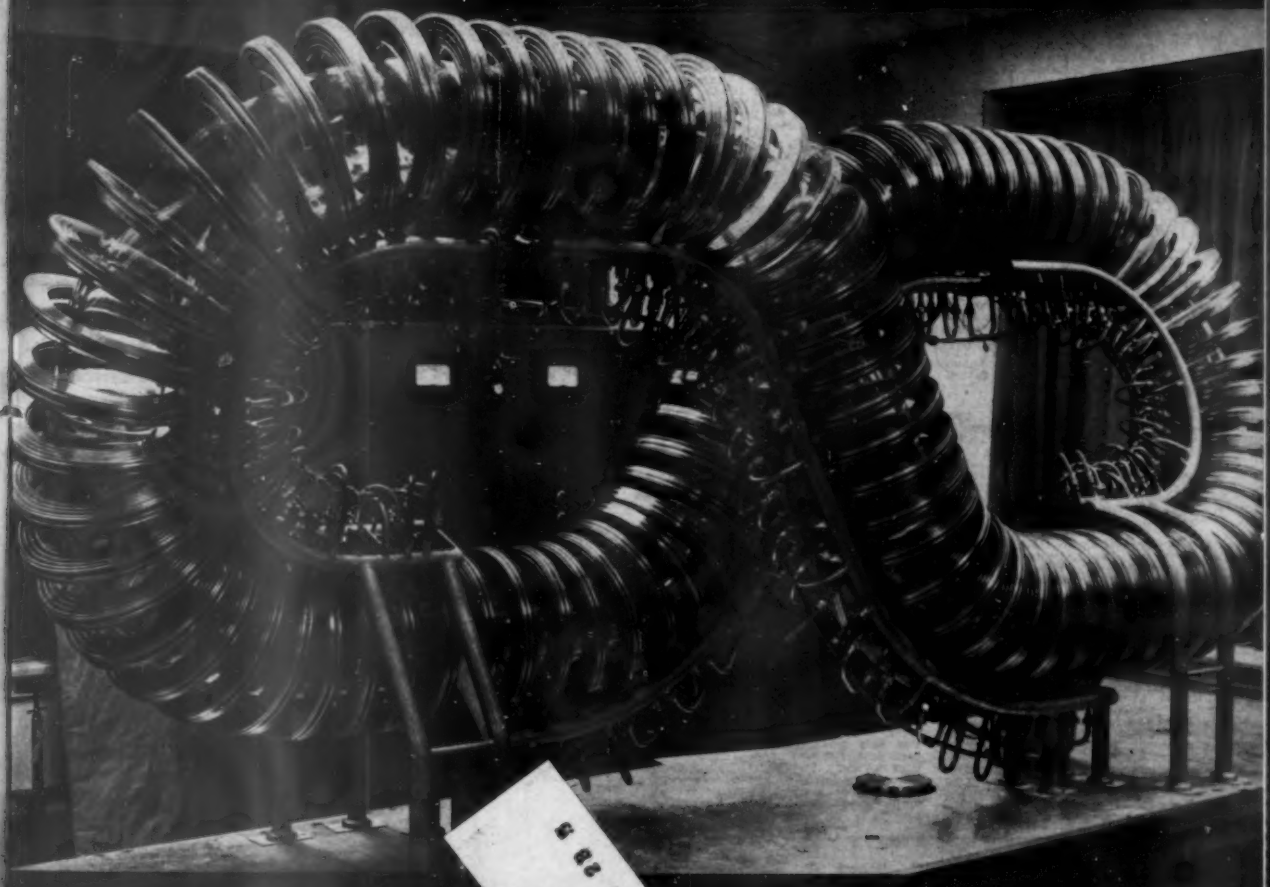
SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE



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It keeps you within your budget . . . keeps you from overspending . . . protects you from the mistakes companies —even banks . . . often make . . . adds all the figures for your income tax . . . adds up stock dividends . . . checks expense accounts . . . plus a thousand other adding chores . . . and pays for itself a hundred times over in the money you save.

AN ITALIAN INVENTION

An eminent inventor in Italy discovered the secret of the fool-proof, non-electric, spinningwheel adding mechanism inside this machine. He had been trying for years to develop a real adding machine at a price for everyone . . . even in war-poor Europe. NOT another flat pocket adder that requires you to read long instructions before you can begin to operate it. Instead . . . he wanted a real, desk type adding machine . . . that anyone could operate, even a child . . . that would be automatic . . . fool proof . . . and, above all, within the pocketbook of everyone!

He found the answer after studying the spinning wheels inside electric computing machines. He came upon a way to let a person's hand supply the 'power' to the wheels . . . instead of electricity! Just imagine! He invented an adding machine designed so that the gentlest touch makes the wheels inside turn! After one complete turn . . . the first wheel automatically trips the next wheel . . . just like $200.00 electric machines! Nothing to remember. Nothing to do but press down the numbers to be added. Everything else automatic!

When the Italians . . . famous for smaller automobiles and smaller motorcycles . . . started manufacturing this revolutionary new smaller, non-electric adding machine, offices and individuals in Rome, Venice, Florence tried it. WHAT ACCLAIM IT MET WITH! Everywhere it added the longest columns of figures within seconds of the speed of electric machines. Giant companies gave it to secretaries . . . officers, salesmen. Efficiency of entire companies improved. Mistakes were cut down.

And from individuals came even more glowing stories. Instantly adding became a pleasure instead of an aggravating chore. Households became better managed . . . budgets stuck to . . . bills checked . . . mountains of figures added in no time . . . mistakes a thing of the past!

And when this remarkable adding machine was imported to this country, the acclaim was just as great! For here at last was what every home . . . every office . . . every store has been waiting for. The perfect, small, easy to use, automatic, desk model adding machine . . . in beautiful silver tone and blue finish, with big, easy to read numbers . . . and at a price so incredibly low that not a family or store or office can afford to be without it!

FREE TRIAL OFFER

How would you like to try this amazing new gleaming metal adding machine in your home, your office or your store entirely without risking a penny?

We want you to actually test it against automatic, electric adding machines. Compare it for speed, ease of use and accuracy. You must agree that it is almost as fast . . . and just as easy to use . . . you must agree that it will save you endless time, trouble, mistakes and money every week . . . or it won't cost you a penny.

Just push the numbers down. See how the most gentle pressure of your hand turns the wheels inside. See how it adds up to 9,999,999 automatically. And see how just a flick of the clearing bar on the side makes the numbers inside the answer window all whirl back to seven zeros . . . instantly!

Put this amazing adding machine on your desk. See how instead of being too busy to add . . . or in too much of a hurry to be bothered with a complicated pocket adder . . . from now on you will check every calculation . . . check all your bills, statements, estimates, inventories, budgets, reports . . . each in seconds . . . and never make costly mistakes again!

If you are in business, see how this precision adding machine will save you its unbelievable low price a hundred times over. Give one to every secretary, every clerk, every person who ever adds. See how it cuts out trips to your bookkeeper, saves time, improves the efficiency of your entire company.

You must be convinced that ADDIPRESTO is one of the most valuable and useful inventions you ever used or it won't cost you a penny.

Supply Still Very Limited
Mail Free Trial Coupon TODAY

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The price of ADDIPRESTO is only $14.95. Remember, it is a real adding machine with spinning wheels and automatic mechanism . . . the same type as $200.00 office computing machines. But ADDIPRESTO works from the pressure of your hand without electricity! It will save you its remarkable low cost many times over. Because you will USE it . . . over and over . . . day after day. Don't confuse it with flat, hard to use, complicated pocket adders.

However, the supply of genuine ADDIPRESTO machines is strictly limited. The factory in Europe cannot meet the demand. You must mail the free trial coupon below at once. ADDIPRESTO is not yet sold in stores. Act now and get yours by mail.

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FOR THE FIRST TIME —Your Own Personal Desk Model Automatic Adding Machine!

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This original ADDIPRESTO is precision-made from the finest quality materials, and will give you a lifetime of accurate, effective performance. Unconditionally Guaranteed against defects in material or workmanship.

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MAIL COUPON NOW!

MEDICINE

Industry's "Cancer Role"

A doctor tells science writers that industry should spend its advertising dollars to protect the populace against cancer, both on the producing and consuming end.

INDUSTRY'S ROLE in the development of various types of cancer, both among its employes and the general public, was criticized by Dr. Wilhelm C. Hueper of the National Cancer Institute of Bethesda, Md. Verbal volley number one was fired at the automobile industry.

"If the auto industry would spend the money that goes for television shows and flashy chrome on more research, maybe they could develop a device to eliminate the hydrocarbons that are formed from burning gasoline," Dr. Hueper told science writers attending a seminar in Louisville, Ky., sponsored by the American Cancer Society. The recently developed device that can be added to automobiles controls hydrocarbons formed by oil, not gasoline, he explained.

Volley number two was directed at the chemical industry. He said one company pressured him into suppressing results of his study of the incidence of bladder cancer among workers at that chemical company. Dr. Hueper's study showed that a significantly higher incidence of the cancer occurred among workers at the plant than among the general population.

He then moved on to the dye industry, which, he said, refused "point blank" to reveal the number of cases of bladder cancer among that industry's workers. Incidentally, he said, two dyes that are proved cancer producers in man are lipstick colors. They are yellow AB and yellow OB.

Experiments with these dyes revealed that they produce toxicity in animals, not cancer, although they are carcinogenic in humans. Although only a small portion of lipstick is eaten by women, these color agents, when applied to the skin for long periods of time, can cause cancer.

The German-born researcher then named several companies in the tar, petroleum, asbestos and chromium industries as guilty parties in the move to suppress facts concerning the occupational hazards of these industries. He referred to, but did not name, a recognized medical man who represented the asbestos industry. Dr. Hueper said he pointed out to the industrial medical man the results of a study which revealed that workers in that industry had 15 times the chance of developing lung cancer than the general population. The prominent medical man chose not to reveal this information, "for patriotic reasons," as Dr. Hueper quoted him.

Tackling the drug industry, Dr. Hueper reminded reporters that arsenic is known to cause cancer in humans. It has not, on the other hand, ever been known to cause cancer in experimental animals. Yet, at least one drug firm is manufacturing a preparation that contains this carcinogenic agent. The preparation is now being added to cattle and chicken feeds, pesticides, herbicides, and even some tonics for human consumption. All of these can, in one form or another, be eaten by humans, he pointed out.

Summing up, Dr. Hueper warned that:

"We are superimposing on our natural disease producing environment a new set of disease factors that are industry-produced and man-made." Numerous vested interests, specifically, industry, are constantly attempting to conceal industry's role in the cause of cancer among employees of these industries and the general population, he charged.

Cure Prediction Hit

"PSYCHOLOGICALLY BAD'" was the term used by a cancer researcher to describe predictions that the cure for cancer is just around the corner and that a breakthrough has been discovered.

POTENTIAL POWER — This experimental thermionic tube has a glowing wire that emits electrons, making a current flow in ionized cesium gas. The cesium capsule at the bottom of the tube is pointed out by Dr. J. W. Coltman of Westinghouse Electric Corporation, where thermionic power generation is under development. Thermionic devices may be used for space power or to add extra power to nuclear generating stations.

Scientists have made little, if any, progress in the treatment of the very advanced cancers that are beyond surgical intervention, Dr. E. V. Cowdry of the Wernse Cancer Research Laboratory at Washington University School of Medicine, St. Louis, told science writers.

Favorable reports of achievements in cancer research can give a false impression, leaving people with the attitude that they need not watch for signs of cancer in themselves because the "cure" for cancer is bound to be found soon. Dr. Cowdry said he thought medical science will never be capable of preventing all cancers.

He believes the principal barrier to cancer control is lack of knowledge of cancer cells themselves. Another barrier is the attitude of people, which is very important. For one thing, people should be aware of cancer-causing substances and be willing to to avoid them. This requires constant vigilance through many years, he said.

Obviously, cancer control is very different from the control of infectious diseases that can, in so many cases, be obtained from a single dose of a vaccine.

Dr. Cowdry said he believes a big step forward in the control of cancer will come when the lives of individual body cells are better understood. He urged that work be done on individual cancer cells. The concept that each cancer is a population of cells in various stages of birth, maturity, old age and death must be studied, he said.

Since virtually nothing is known about the "vital statistics" of cancer cells, Dr. Cowdry said, it is important to learn which cluster of cells in a cancer grows more diversified with the time in which the cancer has been established and during which period of life the cluster is progressing.

At present, medical scientists can recognize cancers earlier and treat them somewhat better than formerly, he reported. However, the fact remains that an estimated 265,000 Americans will die from cancer this year. Approximately 85,000 of these will die because they will not get treatment early enough. A total of 770,000 will be under medical care for cancer during 1960.

Science News Letter, April 9, 1960

ROCKETS AND MISSILES

U.S. Launches Tiros I, TV Scans Cloud Covers

A 270-POUND weather satellite, Tiros I, has been launched from Cape Canaveral, Fla. Shaped like a giant pillbox, Tiros I carries two TV cameras to take still photographs of the earth's cloud cover.

The launching is part of a long-range program designed to develop a satellite capability for providing world-wide meteorological information. This would greatly assist meteorologists in making forecasts.

Tiros I is expected to broadcast its pictures for about three months. One of its cameras will take pictures of areas 800 miles wide. The second will photograph smaller areas within the 800-mile areas pictured by the wide-angle camera.

Science News Letter, April 9, 1960

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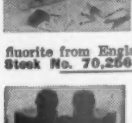

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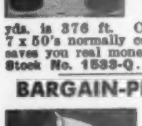

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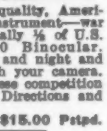

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PUBLIC HEALTH

Picked for Radiation Study

ST. LOUIS has become the second target area singled out for a thorough investigation to establish exactly how much damage is being done by the radiation occurring daily throughout the country.

First area to be singled out for such a study was San Juan County in New Mexico, where radioactivity from radium in the surface water of the Animas River has been higher than that found in most areas in the United States. Surgeon General Leroy E. Burney of the U.S. Public Health Service said that extensive data already obtained on the amount of radioactivity in that southwestern area will be used to study the amounts of radioactivity people are taking in, the amounts retained, the total "body burden," and the effects upon their health.

Health officials expect to be able to determine whether an actual or potential health problem exists, and if so, to what extent.

In addition, surveys of dairy farms will soon begin in the various milk sheds serving St. Louis. Water supplies, sources of animal food, climate, farming and animal feeding practices and other variables will be studied. The milk shed study will wind up with a series of field experiments to determine whether, if necessary, the radioactive content of milk can be reduced by modifications in dairy farming practices.

The levels of strontium-90 have been somewhat higher in the St. Louis milk shed than in other areas. The last reading, for October, 1959, reported 25.1 micro microcuries per liter, which is now close to the new maximum permissible level of 33. Recently, the level of strontium-90 intake permitted for humans was lowered from 80 to 33 micro microcuries. Each of these figures applies to intake over a lifetime. A curie is a basic unit of radioactivity equal to the radiation from a gram of radium.

The new figure was exceeded only once, in April, 1959, when it rose to 37.3 in St. Louis. The new lowered permissible limit of 33 micro microcuries will be used only until a definitive report is issued by the Federal Radiation Council, established by the President.

Science News Letter, April 9, 1960

MEDICINE

Cases of Hepatitis Hit Peak in March

THE LIVER DAMAGING disease known as hepatitis is on the rise in this country, U. S. Public Health Service data reveal.

The latest figure of 851 cases, for the week ending March 19, includes both serum and infectious forms of this disease. The highest recorded number of cases for a 12-month period was 50,000 in 1954. There was a slow decline each year thereafter until 1958 when the number of cases began to rise again.

The peak of this "cycle" of the disease will probably occur in 1961, Dr. C. C. Dauer, medical adviser to the National Office of Vital Statistics, explained. To date there have been 8,160 reported cases this year compared to 6,195 for the same length of time last year. The disease usually reaches its peak in March, after which it is expected to dip for the summer months.

Since records of the incidence of the disease have been kept only since 1950, the exact cycle of hepatitis has not been determined.

Both forms of the disease are caused by viruses in the bloodstream. Symptoms include fever, skin rash, fatigue, headache, nausea, chills, diarrhea and itching. The liver can also be severely damaged.

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GENERAL SCIENCE

Scientists Advise Congress

Scientist tells Congress that aid to the physical sciences on a large scale, like the grants to medical science, is needed. "Lump subsidies" to universities are recommended.

UNITED STATES scientists should know within the next ten years the extent to to which such weather factors as lightning, hail and rain can be modified or controlled, a distinguished meteorologist believes.

Dr. Sverre Petterssen of the University of Chicago advised the House Committee on Science and Astronautics, meeting for the first time with a panel of scientists, that information from solar and earth satellites should provide a picture of the energy input and output of the earth's atmosphere by 1970. Coordinated with a global system of atmospheric observations, this information will provide the first observations of how the atmosphere works as a great, integrated system.

Martin Goland, a scientist at the Southwest Research Institute in San Antonio, Tex., was also optimistic about the future of fuel cells—efficient battery-like devices now being developed that convert chemicals to electricity.

He said small cell units in homes and industry could provide cheap, reliable electricity without extensive wiring to a single power plant. The cells, he said, would have more immediate usefulness as compact power sources inside space craft and submarines.

Much of the $1,500,000 now being spent on research on fuel cells is spent by private business, Mr. Goland said. He suggested a central research organization could coordinate the work and promote freer exchange of information.

The discoverer of radiation belts about the earth, Dr. James A. Van Allen of the State University of Iowa, told the committee that the National Science Foundation's pilot program to provide university facilities for the physical sciences "does only one percent of the job."

He asked for aid to the physical sciences on a larger scale, similar to the National Institutes of Health's grants in medical areas. And he criticized the U.S. policy of short-term grants for research projects.

"Lump subsidies," he said, should be given to universities for distribution for scientific research. Dr. Van Allen said this method is commonly used in Great Britain and Scandinavian countries, and has proved successful.

Physicist James L. Tuck of the Los Alamos Scientific Laboratory in New Mexico told the Joint Congressional Committee on Atomic Energy:

"We (at Los Alamos) are now prepared to bet our reputations that we have had a thermonuclear reaction." This announcement reported a small but important step toward the harnessing of the power of the hydrogen bomb.

At the joint committee hearings, Dr. David B. Hall of the Los Alamos laboratory, pointed out one advantage of nuclear power: no smog.

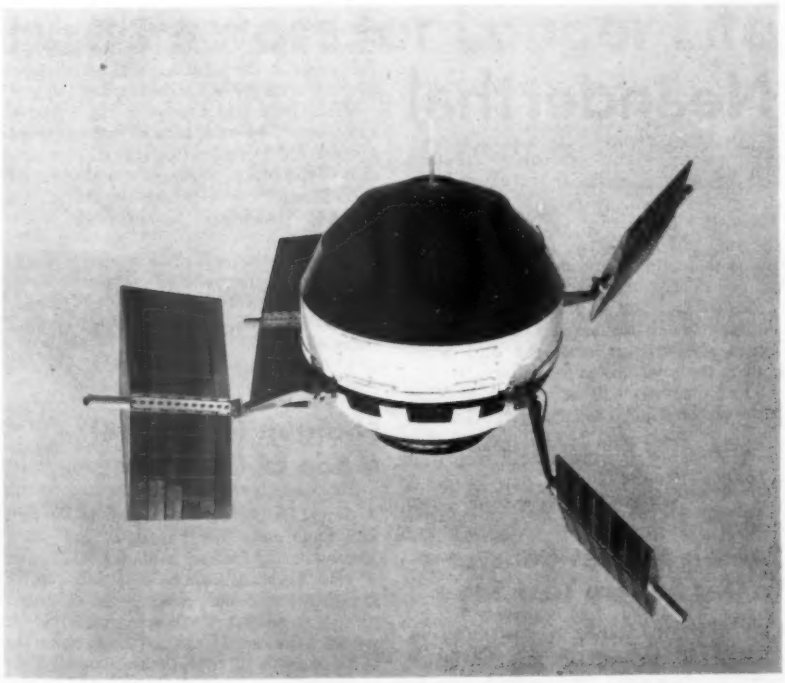
"The increases in the carbon dioxide content of atmosphere from ever increasing consumption of fossil fuel, such as coal, oil and wood, might conceivably be altering the climate and geography of the world both by increasing the mean temperature, and hence the sea level, and by affecting the cloud formation and rainfall," Dr. Hall said.

"Both of these effects would tend to make the average climates warmer and drier. It is a matter of record that bodies of water have recently disappeared after supporting marine life for many thousands of years, a fact which supports the theory that man is changing his environment."

Dr. Bernard Manowitz of the Brookhaven National Laboratory, Upton, N. Y., announced two studies by the lab which showed it is possible to design a special nuclear reactor to produce chemical products, including fertilizer.

Atomic energy, he said, can break chemical bonds and form active materials which recombine as new chemical substances.

Science News Letter, April 9, 1960



PLANETOID IN ORBIT—Pioneer V, orbiting between earth and Venus, carries a 150-watt radio transmitter, believed to be the most powerful yet in space. The transmitter, within the 26-inch sphere, is expected to radio information as far as 50,000,000 miles. The paddles contain solar cells that convert the sunlight into electric energy which charges the nickel cadmium batteries that make the transmitter run.

GENERAL SCIENCE

Basic Research Aided If Bill Passes Congress

A BILL to "further and encourage basic scientific and technological research" has been introduced in Congress by Rep. Victor L. Anfuso (D.-N.Y.).

It would provide for establishment of a "ten percent fund" to be used in research and development contracts entered into by the Federal Government. Under this proposal, the Congressman explained, contractors would be entitled to an additional ten percent of the total sum of the contract if they work on basic and supporting research.

"Authoritative sources tell me," Mr. Anfuso said, "that we now have enough scientific brains and private industrial know-how which, if properly mobilized and utilized, would not only enable us to catch up with the Russians where we have fallen behind, but to surpass them in all scientific and technological endeavors. The key to this is basic research and this we must encourage to the fullest measure.

Science News Letter, April 9, 1960

ROCKETS AND MISSILES

Helium to Cool Space Ships

WRAPPING manned space vehicles with a thin blanket of gas may be the solution to the problem of air-friction heating during re-entry into the earth's atmosphere.

While re-entry difficulties have been overcome for ballistic missiles, they are still unsolved for the manned space vehicles and maneuverable missiles of the future. Ballistic missiles must endure extreme heat for only about 30 seconds. Maneuverable and manned vehicles, on the other hand, must endure heat for longer periods—up to 50 minutes—because they will enter the atmosphere at shallower angles and will decelerate at slower rates than ballistic missiles. Deceleration forces of ballistic missiles exceed those that the human body can withstand.

The skin heating problem of all space vehicles originates in what is called the boundary layer, a thin film of gas molecules from the atmosphere that collects on the skin of any object flying through the atmosphere. At speeds of 14,000 miles an hour and more, the gas temperature around the nose can rise to a dangerous 15,000 to 18,000 degrees Fahrenheit. If this heat is not dissipated, the vehicle will burn up like a meteor as it streaks through the atmosphere.

Scientists at California Institute of Technology have used a wind tunnel to blow hot air at high speed at a nose cone to simulate a missile's flight. At the same time, they arranged to have helium gas ejected from a hole in the front of the cone.

The onrushing hot air was found to spread the helium in a thin, continually flowing blanket over the cone's surface. The helium, in turn, prevented the hot shock wave layers of air over the nose from transferring much of its heat to the cone, and absorbed and carried away most of the heat.

The Caltech researchers, headed by Prof. Lester Lees and Dr. Clark B. Millikan, have calculated that a protective layer of helium only one-sixteenth of an inch thick flowing over the nose of a missile two feet in diameter would permit the cone's skin temperature to be held to a maximum of about 2,500 degrees, well within the tolerances of certain materials.

Research has also shown that a comparatively small amount of helium is required to keep a vehicle's skin from overheating. Prof. Lees estimates that on a 4,000-mile flight lasting about 20 minutes at an altitude of 20 to 30 miles, only about 15 pounds of helium—second lightest of all the elements and a great heat absorber—would be required to blanket the nose of a typical manned space vehicle.

Science News Letter, April 9, 1960

ANTHROPOLOGY

Return to Dig Neanderthal

FOUR AMERICAN anthropologists will leave for northern Iraq in June to spend the summer digging out remains of Neanderthal Man and his culture.

The expedition will return to a huge cave in the Shanidar Valley, the excavation site that yielded skeletal remains of a prehistoric infant in 1953 and skeletons of three prehistoric men in 1957.

One of the main purposes of this fourth expedition is to recover remains of a post-cranial skeleton of an adult Neanderthal. It was discovered in 1957 but could not be be removed because it is under tons of rocks and earth in the cave.

Dr. Ralph S. Solecki, Columbia University anthropologist, will direct this expedition, as he did the other three, in 1951, 1953, and 1956-57. His wife, Dr. Rose L. Solecki, will supervise the excavation of Zawi Chemi Shanidar, an early village near the cave. There is evidence that the same people occupied the cave and the village at different seasons of the year about 10,800 years ago.

Dr. Solecki said the village site appears to contain data that will throw light on the period of human history when man "began to emerge from a hunting and gathering stage to one dependent upon products of the fields."

Dr. T. Dale Stewart, curator of physical anthropology at the Smithsonian Institution, will be at the Shanidar cave until the already-discovered, post-cranial skeleton is exhumed. Dr. Stewart is responsible for restoring the 46,000-year-old Neanderthal-like skull found 14 and one-half feet below the Shanidar cave surface in 1957.

Jacques Bordaz, a graduate student in anthropology at Columbia University, will act as assistant archaeologist and work both at the cave and at the village.

The expedition will be allowed to bring back to the United States half of all the duplicated finds. If there is only one of a kind, the Iraqi government will keep it as a national treasure.

Science News Letter, April 9, 1960

PHYSICS

Atomic Rocket Reactor To Get Severe Test Soon

THE FORERUNNER of what may be America's first nuclear rocket reactor is scheduled to be run until it fails.

Upcoming experiments at the Atomic Energy Commission's Los Alamos Scientific Laboratory in New Mexico are aimed at developing the best design for a nuclear-powered rocket.

The reactor, called Kiwi-A, was first successfully tested July 1, 1959. It bears little resemblance to a flyable rocket engine but future nuclear rocket engines, like Kiwi-A, may well be gas-cooled reactors in which the gas is discharged at high velocity through a nozzle at the rear of the reactor to produce thrust.

The failure tests coming up will determine safety margins and limits of performance for this engine, R. E. Schreiber of the Los Alamos laboratory told the Congressional Joint Committee on Atomic Energy in Washington, D. C.

Another use of reactors in space was presented by B. I. Spinrad of Argonne National Laboratory in Lemont, Ill. He said an efficient reactor might some day "in the wild blue yonder" form an artificial sun for radiating heat to workers on another planet. In this concept, uranium oxide would be held as a liquid ball in gravity-free suspension to form a little sun.

Science News Letter, April 9, 1960

AERONAUTICS

Executive Predicts Piggyback Flight

A HUGE, swept-wing jet rises from a long runway. On the jet's back is a winged rocket carrying 30 passengers. At 20 miles altitude, the rocket separates from the jet, accelerates briefly through space and glides to its destination anywhere in the world—in an hour.

Rocket and space techniques now under development will make piggyback planes and flight above altitudes of 40 miles a commercial reality around 1980 or 1990, Leston Faneuf, chairman of the board of Bell Aircraft Corporation, told an audience at the University of California, Los Angeles.

Mr. Faneuf said rockets in the fringe of space would be subject to re-entry temperatures of 2,500 degrees Fahrenheit. The outer skin of the rocket transport would glow red hot. During the high speed glide to the ground, passengers would feel nearly weightless.

He added that a piggyback system would weigh half again as much as today's heavy bombers. It would be especially suitable, he said for intercontinental flights of 5,000 miles or more.

Science News Letter, April 9, 1960

CHEMISTRY

Shotgun Has Barrel Made of Glass Fiber

A SHOTGUN, just developed, is the first firearm to use a barrel made of glass fiber. The lightweight barrel is made of 500 miles of glass fiber chemically fused and bonded to a thin steel tube. Among its advantages to sportsmen are increased durability (it cannot rust), added safety (it has twice the burst strength of steel), cooler shooting (it has better insulating qualities), and lighter weight. Introduced at the annual meeting of the National Rifle Association, the semi-automatic shotgun was developed by the Winchester-Western Division of the Olin Mathieson Chemical Corporation, New York.

Science News Letter, April 9, 1960

BOTANY

Headway in Plant Disease

A MAJOR breakthrough on plant research has been made with the discovery of substances in plants that determine their physiological susceptibility to disease.

A team of Federal-state scientists has uncovered the first concrete evidence of such substances, the U.S. Department of Agriculture reports.

A protein of the globulin type found in a particular race of flax rust fungus was found to occur also in flax plants susceptible to the same fungus. Plants resistant to that particular type did not contain the protein.

The discovery may prove especially important to plant breeders searching for disease-resistant plant material. Disease resistance is a primary objective in the development of almost all new crop varieties.

Physiological resistance to diseases is inherent in the genetic make-up of some plants. It is often observed but not yet understood. When cells of such resistant plants are invaded by a disease organism, these cells and some of those around them die. This causes the death of the invading pathogen, so the disease does not spread.

Physiological disease resistance in plants differs from structural resistance, in which movements of the pathogen is prevented by the plant's cuticle or by cell walls.

Working with globulins from each of four lines of flax and four races of the rust fungus *Melampsora lini*, the researchers found a clear relationship between susceptibility to a particular fungus race and the presence in the plant of the protein that characterizes the race.

One flax line, for example, known to be susceptible to all four races, contained the characteristic proteins of all four. Another line contained only the two proteins for the races to which it was susceptible, and not the proteins characteristic of the races to which it was resistant. A third line contained the three proteins for the races to which it was susceptible and lacked the protein for the race to which it was resistant. The fourth line contained only the protein for the race of fungus to which it was susceptible and lacked the other three. The findings were made by Dr. Harold Flor of USDA's Agricultural Research Service, John A. Doubly of the North Dakota Agricultural Experiment Station, and Dr. Carl O. Claggett of Pennsylvania State University.

Science News Letter, April 9, 1960

MEDICINE

Two Factors for Longer Life

IF YOU CAN retain your pep as well as your desire to use it, you will probably live to a ripe old age.

A New York physician told the American Medical Association's Committee on Aging in Baltimore, Md., that the two major elements in prolonging life are the preservation of energy and a high degree of motivation.

The first of these, Dr. Theodore G. Klumpp said, can be maintained through proper diet, exercise and rest. The second comes from purposeful useful activity.

"I believe that we must do everything we can, as we grow older, to resist the inclination to slow down the tempo of our living," he said. "I am convinced that if you will just sit and wait for death to come along, you will not have long to wait."

Earlier at the two-day regional conference, Dr. David B. Allman of Atlantic City, N. J., past president of the AMA, promised more useful and productive lives for the aging population. He cited as "Medicine's Blueprint for the New Era of Aging" the following six points:

1. Stimulation of a realistic attitude toward aging by all people.
2. Promotion of health maintenance programs and wider use of restorative services.
3. Extension of effective methods of financing health care for persons over 65.
4. Expansion of skilled personnel training programs and improvement of medical facilities.
5. Amplification of medical and socio-economic research in problems of aging.
6. Leadership and cooperation in community programs.

Another physician, Dr. Franklin Yoder, an official of the AMA, called for a vigorous program to eliminate handicaps imposed on older persons. Elimination of physical, social, mental, economic and employment handicaps, he said, "will insure the seniors of a greater opportunity for life fulfillment and would help them meet their overall economic needs with independence and dignity."

Science News Letter, April 9, 1960

TECHNOLOGY

TV Camera Will Inspect Under Intense Radiation

A SHOEBOX-SIZE television camera that is not easily damaged by nuclear radiation will soon be used to inspect nuclear reactors where radiation is too intense for observation windows. Special construction elements, including aluminum, magnesium, silicon, titanium and zirconium, allow atomic radiation to pass through the camera without harming it. The new camera, displayed by International Telephone and Telegraph Corporation at a meeting of the Institute of Radio Engineers, lasts much longer than conventional closed-circuit TV cameras, which can deteriorate in 10 to 30 minutes under intense radiation.

Science News Letter, April 9, 1960

NUTRITION

Discover New Vitamin Of the B-Family Group

A NEW VITAMIN has been isolated, marking the first discovery of a new vitamin since 1948, when vitamin B-12 was found. When its chemical structure and properties are determined, Dr. J. R. Couch of Texas A and M College told the Distillers Feed Research Conference, the new vitamin is slated to become the 15th vitamin and the 10th B vitamin known to science. Chemical companies will then attempt to synthesize it and make it available to the public. Presently known are vitamins A, C, D, E and K, as well as nine B vitamins.

Science News Letter, April 9, 1960

PHYSICS

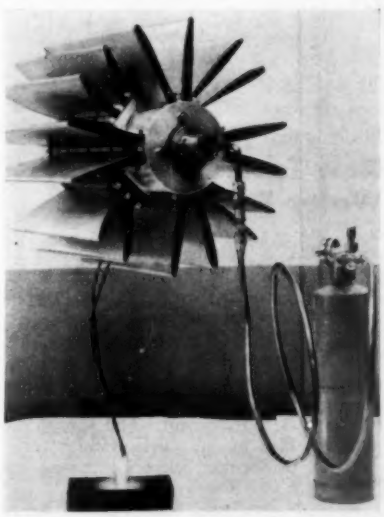
Stellarators Used to Study Thermonuclear Reactions

See Front Cover

TWELVE THEORETICAL physicists are at present engaged in plasma research at Princeton University, using results of research from five stellarators, which are one kind of device by which the possibilities of controlling thermonuclear reactions can be studied.

The figure eight tube, seen on the cover of this week's SCIENCE NEWS LETTER, has been adopted for some stellarators to help prevent particles from escaping.

Science News Letter, April 9, 1960



ELECTRICITY FROM GAS—This thermoelectric generator, developed by General Instrument Corporation, burns propane gas to produce electricity that may be used for radio communication, navigational aids and scientific instrumentation in remote areas, such as the Arctic, where other power sources are unavailable.

GENERAL SCIENCE

Books Decay Rapidly; Durable Paper Sought

BY ABOUT 1980, nearly 40% of the so-called "permanent" books printed between 1900 and 1949 will have such brittle pages that they will have to be taken out of circulation completely.

Researchers at the Virginia State Library, Richmond, Va., chose 500 non-fiction books which had not been handled excessively and tested the paper by machine tearing and bending. Only one percent of the books had "high strength" papers. The other 99% were expected to last about 50 years or less with moderate usage.

A published report of the tests stated that although librarians had been concerned about book decay, no one had guessed that the situation was so serious.

Dr. Robert V. Hobbs, a paper analyst at the National Bureau of Standards in Washington who has followed the Virginia study, said that the acidity of wood pulp used in paper manufacture is the factor that causes paper to decay. Papers made of rags have a lower acid content and last longer.

The acid gets into the paper during the processing of wood pulp, and up until a few years ago, Dr. Hobbs said, manufacturers were not particularly concerned about acid content because no one knew that it caused decay.

The Virginia researchers are now working on a technique to stop acid-caused decay of books already in print. They do this by dipping the paper in a solution that neutralizes the acid, Dr. Hobbs explained.

To demonstrate its point, the Virginia State Library printed the report of the tests on a newly developed, low-acid paper.

Science News Letter, April 9, 1960

PUBLIC HEALTH

New Tools Needed for Water Pollution Fight

AMERICA is fighting a losing battle in trying to meet today's mounting water pollution problems with outdated equipment, a Government report discloses.

It shows that the total combined national expenditure for water pollution research is now running less than $6,000,000 a year. Less than one-third of this is spent by the U.S. Government. The special report was filed by the Public Health Service with the Senate Select Committee on National Water Resources.

"It is obvious," said Sen. Robert S. Kerr, (D.-Okla.), committee chairman, "that a country spending over $1.5 billion per year on 'soap operas' and other forms of TV and radio entertainment should invest much more than $6,000,000 annually to find out how to keep these fine new products of our soap factories and other chemicals from spoiling our drinking water."

In addition to scientific research, the PHS report urges:

1. Nation-wide planning of water quality control programs for river basins at a rate up to $8,000,000 a year.

2. Collection of data on sources, strength, volume and hazards of all types of pollution.

3. Construction of the $4.6 billion unbuilt backlog of remedial works needed to use the best methods now available to clean up water sources in the next five years.

4. Better enforcement of state and Federal anti-pollution laws.

5. Legislation to meet new pollution problems, and action to establish wider public understanding of the pollution problem.

Science News Letter, April 9, 1960

ENGINEERING

National Academy Of Engineering Proposed

A PROPOSAL to establish a National Academy of Engineering has been made by Dr. J. Herbert Hollomon, general manager of General Electric's general engineering laboratory. The proposed Academy would be set up by Congress and would be on a par with the National Academy of Sciences. Dr. Hollomon believes that the establishment of such an organization would help disentangle the roles of science and engineering, which he said have become "confused" in recent years.

Science News Letter, April 9, 1960

ANTHROPOLOGY

"Chin" of Ancient Bone Found Due to Cancer

A VERY ANCIENT jaw bone from Africa which has puzzled scientists for years is identified as probably belonging to a creature intermediate between the ancient form known as Atlanthropus and modern man, or possibly it belonged to one of Africa's ape men.

Because the jaw has what appears to be a chin, scientists at first believed it to belong to a man. A chin is a distinguishing human characteristic. But now Dr. Phillip V. Tobias, anthropologist of the University of the Witwatersrand, Johannesburg, reports in Nature, 185:946, 1960, that the "chin" is really a bony growth caused by a bone cancer and that the jaw is not human at all.

When the mystery bone was unearthed at Kanam in Kenya, Africa, by Dr. L. S. B. Leakey, the "chin" led scientists to believe that the jaw belonged to modern man, but the site in which it was found indicated that the animal lived in early Pleistocene times, perhaps a million years ago. Scientists found it difficult to believe that modern man lived that long ago and in 1935 it was recommended that the mystery jaw be placed in "a suspense account" pending further discoveries.

"We are now," Dr. Tobias said, "in a position to consider the age of the Kanam specimen, free from any misconceptions that it is Homo sapiens."

Science News Letter, April 9, 1960

IN SCIENCE

CHEMISTRY

Metals Purified by Gas Chromatography

ALLOYS can now be separated into their constituent metallic elements by means of gas chromatography—a technique commonly used in the analysis of gas mixtures.

Dr. Frank E. DeBoer of the Argonne National Laboratory, Lemont, Ill., has used this method to separate the metals in an alloy of zinc and cadmium, two common metals with similar chemical properties, he reports in Nature, 185:915, 1960.

Chromatography in general works on the principle that, if a solution containing a number of chemicals is allowed to flow through a constricted medium, through blotting paper for example, the different chemicals in the solution will travel at different speeds and may thus be separated. If the chemicals are of different colors, bands of color will be seen in the paper.

The same principle is used in gas chromatography, the mixture of gases being diluted with an inert "carrier gas," such as helium, and passed through a long narrow tube. The different fractions are collected at the end.

In this case, helium at 1,150 degrees Fahrenheit was passed over the alloy, which was also at 1,150 degrees, and the metal vapors condensed, after separation, on a cold surface.

This is believed to be the first time that the direct purification of metals in this way has been reported. The work was sponsored by the U.S. Atomic Energy Commission.

Science News Letter, April 9, 1960

RADIO

Sun Can Relay Signals, Radio Engineers Told

THE SUN could be used to relay radio messages between distant points on earth, a scientist told the international convention of the Institute of Radio Engineers.

Donald J. Blattner of the RCA Radio Laboratories at Princeton, N.J., said radar pulses bounced from the sun demonstrate that the sun's gases could also reflect coded radio signals.

He said the system is technically feasible and may someday be justified by the growing demand for more communication channels. It could be especially useful when the moon is not in position to serve as a reflector for radio signals. The solar method would require large antennas, a transmitter with power output of a million watts and electronic data-handling equipment.

Science News Letter, April 9, 1960

NCE FIELDS

VIROLOGY

Russia's 'Flu Vaccine Is Inferior to America's

RUSSIA'S live virus influenza vaccine appears to be less effective than America's killed virus vaccine, a Denver researcher reports.

The Russians have concentrated on live influenza vaccines, which are made from live but weakened viruses and administered by nasal inhalation. Vaccines used in this country are made from killed viruses and administered by injection.

The live virus vaccine proved to be moderately effective in boosting antibody levels in persons who had no such previous disease fighters before contact with the vaccine. Persons who had acquired antibodies before inhaling the vaccine, however, showed little booster effect, Dr. Gordon Meiklejohn of the University of Colorado School of Medicine reported in the Journal of the American Medical Association, 172:1354, 1960.

Furthermore, the American vaccine, made from killed viruses, proved more effective than the live vaccine in raising antibody levels of persons who had antibodies at the time of the vaccination.

The report was based on observations of the responses of 27 volunteers who received the live vaccine. No illness was observed in these persons.

Science News Letter, April 9, 1960

ZOOLOGY

California Zoo Apes Become "Medical Firsts"

NOELL, SCOOP AND TRIA, three apes that live in the San Diego zoo, have made medical history.

They "came down" with chicken pox while in their zoo cages during a period last summer when there was a high incidence of that disease among children in San Diego County.

Now researchers believe that these three anthropoid apes are the first nonhuman animals to become naturally infected with chicken pox, Dr. Werner P. Heuschele, veterinarian at the San Diego Zoological Gardens, reports in the Journal of the American Veterinary Medical Association, 138:256, 1960.

Noell is a two-and-a-half-year-old female orangutan. Scoop is a 20-month-old male gorilla, and Tria is a three-and-one-half-year-old female chimpanzee. All three are in close contact with children at the zoo. They attend parties held in the Children's Zoo area and are handled and petted frequently, Dr. Heuschele explains.

They have even attended luncheons, dinners, theater openings, charity shows and other functions. The veterinarian expresses the belief that these opportunities for close contact with humans, a unique feature at the San Diego Children's Zoo, exposed the apes to infectious doses of virus particles. Most zoos avoid this situation by exhibiting apes from behind glass or at least at a distance from visitors, he points out.

Chicken pox has been produced in monkeys by direct inoculation of the virus but there appears to be no references in medical history to natural infection such as this among subhuman primates, he reports.

Tria, the chimp, was the most seriously affected by the disease, exhibiting a fever and rash, while Noell and Scoop appeared relatively untroubled. This could be due to a difference in individuals or difference of susceptibility of species, or to exposure to a small amount of the virus, he concludes.

Science News Letter, April 9, 1960

TECHNOLOGY

Columbium Toughens Weldable Steel Pipe

ADDING small amounts of columbium to steel during its manufacture has been found to strengthen it and to make welding easier.

With the rapid expansion of the natural gas industry, there has grown a demand for a steel suitable for the construction of long-distance, trouble-free pressure pipelines.

Higher gas pressures in these pipelines has dictated use of higher strength steels. These have usually involved high carbon contents, resulting in more brittle steels and great welding difficulties, especially at low temperatures.

This problem has now been solved by the Great Lakes Steel Corporation, Detroit, a division of the National Steel Corporation in Pittsburgh, Pa. Great Lakes will produce a new family of steels containing columbium.

These steels, although developed for use in gas pipelines, have already generated wide interest because of their possible use in truck frames, highway lamp posts and railroad equipment.

Making the steels economically attractive is the fact that the price of columbium has dropped over the last 10 years and large deposits of columbium were recently discovered in Quebec.

Science News Letter, April 9, 1960

AERONAUTICS

Study Shows Alert Pilots React in 0.23 Second

ALERT PILOTS react in about 0.23 second to large right-and-left disturbances of their planes in flight, a study by the National Aeronautics and Space Administration shows. Reaction time for moderate pitchings of the planes, however, was 0.33 second. The study was made of pilots flying jet trainers. Special modifications of the planes permitted a second pilot to disturb the plane without moving the control stick of the pilot being tested.

Science News Letter, April 9, 1960

ENTOMOLOGY

Flies May Be Controlled By Chemical Sterilization

CONTROL OF HOUSE FLIES and fruit flies by chemical sterilization, so that they cannot reproduce, is being tried in experiments by the U.S. Department of Agriculture.

The experiments, involving one of three new methods of insect control proposed by USDA's Dr. Edward F. Knipling, make use of a modified glutamic acid to bring about self-annihilation of insects by chemical sterilization.

Tests have shown that a concentration of as little as one one-hundredth of one percent of this chemical, added to food for laboratory-reared house flies, has prevented egg-laying or hatching and that one-half of one percent in a single feeding will cause permanent sterility in female flies.

Male flies, according to tests made so far, are not sterilized by eating food containing the chemical. To be fully effective, chemical sexual sterilants of maximum effectiveness will have to produce sexual sterility in both males and females without adverse effects on mating behavior.

Chemical sterilization, if eventually successful, would not require release of treated flies to wipe out normal ones because food treated with an effective chemo-sterilant could be made generally available.

Although satisfactory for use in testing the principle of chemical sterilization, the USDA points out, modified glutamic acid may not prove completely suitable as a practical means of insect control by this method.

The other two control and eradication methods suggested by Dr. Knipling include the production and release of diseased insects to infect and kill their own kind, and of insects possessing lethal genetic traits that could control an insect pest. The first of these is already being investigated.

Science News Letter, April 9, 1960

BIOCHEMISTRY

Tiny Loops on DNA Seen As Hereditary Mutations

TWO SCIENTISTS have identified hereditary mutations as tiny loops in molecules of DNA.

The loop in the molecules could be the result of a mutation or "error in copying" in the chemical process that passes hereditary signals from cell to cell, Dr. Jacques R. Fresco, chemist at Harvard University, and his assistant, Bruce M. Alberts, explained in the Proceedings of the National Academy of Sciences, 46:311, 1960.

A change as permanent in heredity as a mutation would probably show up as a tiny loop in the molecule of DNA, deoxyribonucleic acid. With the aid of plastic models, the Harvard scientists observed the possible changes in chemical architecture that accompany certain types of hereditary change. They found that changes occurring in mutation can produce loops.

Science News Letter, April 9, 1960

PUBLIC HEALTH

World Fight Against Malaria

With more than one billion human beings living under the threat of malaria, the World Health Organization has called for total eradication of the disease by 1968 if possible.

By GLORIA BALL

EIGHT YEARS from now, human malaria may be a disease of the past, completely wiped from the face of the earth.

This is the plan of the World Health Organization, which began its 12th year on World Health Day, April 7, with the slogan, "Malaria Eradication—A World Challenge."

Such an ambitious campaign, to eradicate, rather than merely control a disease, is an unprecedented "first" in medical history. At present, WHO has enlisted the support of 92 countries and territories.

The major portion of the campaign is directed at breaking the life cycle of the malarial parasite by eliminating the mosquitoes that transfer it from one person to another. This is being accomplished by spraying insecticides inside the houses of persons living in contagious areas.

Formerly, national campaigns tried to annihilate the entire malaria-mosquito population. But later knowledge of the mosquito's habits indicated that such a costly procedure was unnecessary in most cases.

Malaria is transmitted only by the female of several species of mosquitoes belonging to the genus *Anopheles*. These insects are not only carriers, called vectors, they are also an essential host in which the malaria parasite must spend eight to 21 days developing from a non-infective into an infective form. If the mosquito should bite a healthy person before the parasite inside her body is mature, the victim would not contract malaria.

The anopheline, sometimes described as "pretty" and "dapple-winged," usually bites at night. She enters the house of the sleeping human host, in whom the malaria parasite usually lives about one and one-half to three years. After the mosquito has had her meal of blood, she is very sleepy and wants a nap in a windless spot.

The fact that the mosquito takes a nap inside the house is the key to the whole eradication program.

If the house has been sprayed with insecticide, the mosquito will pick up a deadly dose of it during the nap. She may not die immediately but she will not live long enough to transfer the malaria parasite to a healthy person.

In the Amazon basin of Brazil, most of the houses have no walls, consisting only of a roof supported by four poles. Under such circumstances the mosquito takes her nap outside and spraying inside the "house" does little good. To check malaria in this region, a Brazilian doctor suggested adding an antimalarial drug to cooking salt, similar to putting iodine in salt used by goiter-susceptible populations. The drug attacks and kills the malarial parasite in the human bloodstream.

In view of the success of this technique, WHO experts have been asked whether it would not be simpler to distribute drugs to everyone living in malarious areas. Their answer is "no."

Antimalarial drugs only keep the blood parasite at bay for a short time, scarcely one week. An "immense and very efficient" organization would be needed for regular distribution of drugs over vast territories with widely-scattered, and often nomadic, inhabitants. The population would soon tire of coming so often for treatment. It would be difficult to persuade people who were not feeling ill to take drugs regularly over a long period. It would also be almost impossible to ensure that everyone, including children and infants, was getting the proper dose, the experts say.

There are other drawbacks. Quinine, an alkaloid first separated from the bark of the cinchona tree in 1820, has a very bitter taste. Atebrin, now officially known as quinacrine dihydrochloride (under the trade-mark "Atabrine"), is a synthetic antimalarial drug discovered in Germany in 1930. It is preferred to quinine because it acts faster. But it occasionally produces a temporary yellow discoloration of the skin.

Nevertheless, quinine and atebrin, like the newer drugs, plasmoquine, paludrine, chloroquine, the quinolines and the piperidyl quinoline methanols, are essential in the eradication program. They will be most valuable toward the end of the campaign when they will "mop up the last remaining foci of infection."

Malaria is the culprit, WHO officials believe, that for centuries has sapped the vigor of populations and held nations in bankruptcy by causing large-scale work and production losses.

In Ceylon, the disappearance of malaria has resulted in a saving of about $30,000,000 per year. In French Guiana, infant mortality decreased by more than 50% since the large-scale antimalaria operations carried out in 1949-51. In the Philippines, uprooting of malaria has made possible many projects which previously were "out of the question," such as construction of roads, opening of mines and building of houses.

But the picture is not completely bright. The major problems involve mosquito resistance, manpower and money.

At the beginning, nations attempted only control of malaria by using sprays belonging to two chemical groups; one includes DDT, the other—dieldrin. But mosquito

MALARIA FIGHTERS—Spraymen set out on their daily rounds in Ceara Mirim, Brazil. They carry supplies for applying insecticides inside the houses.

populations began to develop resistance to the insecticides.

In 1951 Greece reported that one of its anophelines, *A. sacharovi*, had become resistant to DDT. By 1955 the United States reported resistance to dieldrin in Bolivar County, Mississippi. Since then 16 other nations, from Burma to Ecuador, have reported anopheline resistance to one insecticide group or the other.

It soon became obvious that control measures are not enough. The disease and the insect vectors must be completely wiped out before total resistance sets in.

The present plan is to use DDT in dieldrin-resistant areas, and vice-versa. But no one knows how long it will be before the mosquitoes become so strong that neither chemical group can kill them.

The campaign is now a race against time.

Getting experts and other workers to the key areas is the second hurdle. The whole world effort must be correlated into a military-type attack, and it is no small job for countries who have few experts and little money.

WHO's malaria fund needs $50,000,000 within the next five years. Ninety percent of the cost of eradication programs is borne by the governments where malaria still exists. In many countries the money spent on the malaria campaign represents "an impressive percentage of the national budget."

The program will take one year of organization, four years of total spraying coverage and three years of surveillance to stamp out the stubborn spots.

If all goes well, there will be no malaria in the world in 1968.

Science News Letter, April 9, 1960

RADIO ASTRONOMY

Nine Radio Sources From Outer Space Identified

NINE NEW SOURCES of radio waves from outer space far beyond the Milky Way have been identified. This brings to 14 the number of extra-galactic radio stars now identified.

The new sources were pinpointed by a twin radio telescope with two 90-foot parabola antennas. The whole instrument is mounted on a 1,600-foot long railroad track oriented east-west 250 miles from Los Angeles. This particular telescope is reported to have a greater resolving power than any other instrument in the world.

Prof. John G. Bolton of the California Institute of Technology, who has directed studies with the telescope since it was put into operation two months ago, is now attempting to identify more than 100 extra-galactic radio sources which have been detected, but not precisely located.

This is accomplished by comparing the radio sound and direction with photographs of the area from which the sound comes.

Some bodies in space are difficult or impossible to see because clouds of gas get in the way and block the view. For this reason, an estimated 20% of the galactic and extra-galactic radio sources already detected will probably never be identified.

The Cal Tech studies are being conducted under contract to the U.S. Navy's Office of Naval Research in Washington.

Science News Letter, April 9, 1960

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• Books of the Week •

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ABOUT SAVING WILD LIFE FOR TOMORROW—Solveig Paulson Russell—*Aelmont*, 31 p., illus. by Henry Luhrs, $2.50. Attractively presented conservation facts for young children.

ABOUT THE VEGETABLES ON YOUR PLATE—Veva Elwell Allee—*Melmont*, 31 p., illus. by Isauro de la Rosa, $2.50. For young readers.

AUTOMOBILES WORK LIKE THIS—Phil Drackett—*Roy Pubs.*, 64 p., illus. by George Lane, $2.75. British book for young people.

BEACHES AND COASTS—Cuchlaine A. M. King—*Arnold, E. & Co. (St. Martin)*, 403 p., illus., $14.50. Recent work on coastal problems and the characteristics of coastal processes on the beaches of Britain, Scandinavia, the Mediterranean area, Australia, and the United States.

BIOGRAPHICAL MEMOIRS, Vol. XXXIV—National Academy of Sciences—*Columbia Univ. Press*, 368 p., photographs, $5. Biographies of recently deceased Academy members with chronological lists of their publications.

CARPENTER AND WOOD'S, OUR ENVIRONMENT: Its Relation to Us. OUR ENVIRONMENT: How We Adapt Ourselves to It—Rev. by Paul E. Smith—*Allyn*, 464 p. and 625 p., illus., $3.96 and $4.60. General science textbooks for grades 7 and 8.

CHILDREN AND YOUTH IN THE 1960s: Survey Papers—Margaret Mead and others—*White House Conference on Children and Youth*, 340 p., paper, $2. Specific background information on major Conference themes.

THE CONCEPTS AND THEORIES OF MODERN PHYSICS—J. B. Stallo, Percy W. Bridgman, Ed.—*Belknap Press*, 325 p., $4.75. First published in 1881, this critique of the fundamental concepts of late 19th century physics anticipated the importance of the law of the conservation of energy.

THE EARTH FOR SAM—W. Maxwell Reed, Paul F. Brandwein, Ed.—*Harcourt*, rev. ed., 236 p., photographs, $4.95. The story of the changes the earth, its planets, and animals have undergone over millions of years.

ENGINEER'S DREAMS—Willy Ley—*Viking*, 240 p., diagrams & maps by author, illus. by I. Kashiwagi, paper, $1.25. Engineering projects that could come true, first published in 1954.

ESSENTIALS OF COLLEGE CHEMISTRY—Paul R. Frey—*Prentice-Hall*, 520 p., illus., $6.95. Brief course, using concept-building approach.

EXPERIMENTS IN HEARING—Georg von Bekesy, trans. & ed. by E. G. Wever—*McGraw*, 745 p., illus., $25. Chief results of 34 years of experimental studies on hearing and related problems by international psychologist and physicist. Articles grouped by subject, large section dealing with cochlear mechanics.

FALLOUT: A Study of Superbombs, Strontium-90 and Survival—John M. Fowler, Ed.—*Basic Bks*, 235 p., illus., $5.50. Written by scientists, in layman's language, this book surveys the facts of the nuclear weapons race, nuclear test detection and effects of radiation. Includes appendices with data for reference and glossary.

THE FIFTH MENTAL MEASUREMENT YEARBOOK—Oscar Krisen Buros, Ed.—*Gryphon Press (N.J.)*, 1,292 p., $22.50. Critical reviews of all commercially available educational and psychological tests and books on measurement published during 1952-1958, in English. To help test users make more discriminating selections of tests which will best meet their needs. Includes bibliographies; publishers, periodical, title, name and classified indexes.

FIRST THROUGH THE GRAND CANYON—Steve Frazee—*Winston*, 181 p., map, $2.95. The story of John Wesley Powell's expedition by boat down the uncharted Colorado river.

GROUND BIRDS—Charles L. Ripper—*Morrow*, 64 p., illus. by author, $2.50. About woodcock, road runner and bobwhite, for young readers.

THE HOW AND WHY OF ROCKETS AND MISSILES—Clayton Knight, Paul E. Blackwood, Ed.—*Grosset*, 48 p., illus., $1. Describes for young people space projects such as Dyna-Soar, Argus, Farside and X-15.

AN INTRODUCTION TO THE PHYSICS OF MASS, LENGTH AND TIME—Norman Feather—*Edinburgh Univ. Press (Quadrangle Bks.)*, 358 p., $5. Traces history of the three concepts and on this basis develops the whole subject of the mechanical properties of matter, without use of calculus, for the non-specialist.

MOLTEN SALTS—Benson R. Sundheim, Ed.—*N. Y. Acad. of Sciences*, Annals, Vol. 79. Art. 11, 340 p., illus., paper, $5. Papers of recent research in molten-salt experimentation.

THE MYSTERIOUS EARTH—Lester del Rey—*Chilton Co.*, 214 p., $2.95. Popularly presented science facts.

THE NEW AFRICA—Ellen and Attilio Gatti—*Scribner*, 213 p., photographs, $3.95. Up-to-date review of the rapidly changing ways of a continent, copiously illustrated.

ONE THOUSAND YEARS OF EXPLOSIVES: From Wildfire to the H-bomb—William S. Dutton—*Winston*, 183 p., $2.95. Readable history of how inventions of new explosives helped win wars.

THE OTHER SIDE OF THE MOON—U.S.S.R. Acad. of Sciences, trans. by J. B. Sykes, foreword by A. N. Nesmeyanov—*Pergamon*, 36 p., illus., $2.50. Non-technical description of the automatic interplanetary station, its orbit, photography and image transmission.

PHYSICS: For Students of Science and Engineering, Part I—Robert Resnick and David Halliday—*Wiley*, 554 p., illus.. $6. Text contains contemporary material, many topics treated in depth, with stress on unity of physics. Valuable appendixes with data for reference.

POLAR BEAR BROTHERS—Ylla, text by Crosby Newell—*Harper*, 36 p., photographs, $2.75. Photographic record of bears at play.

PRINCIPLES OF ANIMAL VIROLOGY—F. M. Burnet—*Academic*, 2nd ed., 490 p., illus., $12. Nearly half the text is new, covering recent advances in animal virology.

PROCEEDINGS OF THE INTERNATIONAL CONGRESS OF MATHEMATICS, 1958—J. A. Todd, Ed.—*Cambridge Univ. Press*, 573 p., $12.50. Official record of Congress held in Edinburgh, August, 1958.

PROPHETS, IDOLS AND DIGGERS: Scientific Proof of Bible History—John Elder—*Bobbs*, 240 p., photographs, $5. Tells how the resources of modern archaeology are used to reconstruct ancient Biblical civilizations.

ROCKET PROPELLANT HANDBOOK—Boris Kit and Douglas S. Evered—*Macmillan*, 354 p., $12.50. Basic reference on nearly a hundred chemical propellant substances including fuels, oxidizers, and monopropellants.

RURAL LINES, USA: The Story of the Rural Electrification Administration's First Twenty-five Years, 1935-1960—David A. Hamil, Admin.—*REA (GPO)*, 68 p., illus., paper, 50¢. Story of REA's electric loan program.

THE SEA FOR SAM—W. Maxwell Reed and Wilfrid S. Bronson, Paul F. Brandwein, Ed.—*Harcourt*, rev. ed.. 243 p., photographs, $4.95. Completely revised to include new knowledge since 1935.

SHOTS WITHOUT GUNS: The Story of Vaccination—Sarah R. Riedman—*Rand McNally*, 232 p., illus., $3.50. Young people's history of the scientists and techniques that brought victory over infectious diseases.

THE SOUTH AMERICAN HANDBOOK 1960, including Central America, Mexico and Cuba—Howell Davies, Ed.—*Trade & Travel (Wilson, H. W.)*, 36th ed., 870 p., maps, $3. Information about land, people, history and travel.

SOVIET RESEARCH IN GLASS AND CERAMICS, 1956: In English Translation. Part I: Basic Science. Part II: Glasses, Glazes and Enamels. Part III: Cements, Limes and Plasters, Refractories, Miscellaneous—A. I. Avgustinik and others—*Consultants Bureau*, 218 p., 43 p. and 52 p., illus., paper, $30, $10 and $15; $40 per set. Collection of Russian technical papers through December 1956.

SPACE VOLUNTEERS—Terence Kay—*Harper*, 136 p., photographs, $2.50. About test pilots and space flight experimenters.

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STATE TREES—Olive L. Earle—*Morrow*, unpaged, illus. by author, $2.50. Describes and depicts the 34 state trees for children.

SYMBOLIC LOGIC—Clarence Irving Lewis and Cooper Harold Langford—*Dover*, 2nd ed., 518 p., paper, $2. Unabridged republication of 1932 first edition.

THE TALL GRASS ZOO—Cecil Lubell—*Rand McNally*, 64 p., illus. by Winifred Lubell, $2.75. Natural history in a backyard, ages 5 to 8.

A TRAVELER'S GUIDE TO GOOD HEALTH—Colter Rule—*Doubleday*, 266 p., $3.95. Doctor's advice on medical self-care away from home, about "shots", water, skin care, also glossary of medical phrases in French, German, Italian and Spanish.

TREES, SHRUBS AND VINES: Pictorial Guide to Ornamental Woody Plants of the Northeastern U.S.. Exclusive of Conifers—Arthur T. Viertel —*State Univ. College of Forestry, Syracuse Univ.*, unpaged, illus. by author, paper, $1.25.

VACCINATION CERTIFICATION REQUIREMENTS FOR INTERNATIONAL TRAVEL: Situation as on 15 December 1959—*World Health Organization*, 67 p., paper, $2.75. English-French edition.

UNITED STATES AIRCRAFT, MISSILES AND SPACECRAFT 1960—Aerospace Industries Assn. —*Nat. Aviation Educ. Council*, 153 p., illus., paper, $1. Lists and depicts aircraft and missiles in production.

VACUUM PROCESSES IN METALWORKING—J. Wesley Cable—*Reinhold*, 202 p., illus., $5.50. Covers the field of vacuum technology.

THE WHOLE TRUTH ABOUT ALLERGY—Herman Hirschfeld—*Allergy Pubs.*, 3rd rev. ed., 199 p., illus., paper, 50¢. Doctor explains what allergy is and what to expect from treatment.

WOOD AND CARPENTER'S, OUR ENVIRONMENT: How We Use and Control It—Rev. by Gordon E. Van Hooft—*Allyn*, 688 p., illus., $5.68. General science text for grade 9.

THE WRIGHT BROTHERS—Henry Thomas—*Putnam*, 126 p., illus. by Chas. Beck, $2.50. Juvenile biography.

Science News Letter, April 9, 1960

PUBLIC HEALTH

Common Mosquito Causes Encephalitis

A COMMON mosquito, found in salt water pools, has been identified as the carrier of eastern equine encephalitis, or sleeping sickness. Called Aedes sollicitans, the mosquito carries the virus that causes the disease. Last fall this virus killed 23 people in an epidemic. Animals can be inoculated against this virus, but there is no vaccine to protect man.

Science News Letter, April 9, 1960

Do You Know

A map of the *moon*, on a scale of one inch equals about 80 miles, is being prepared by the Geological Survey and the Army Map Service.

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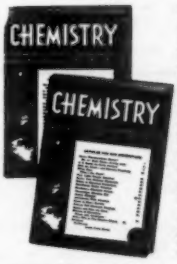

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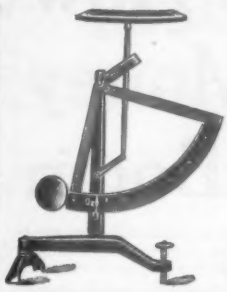

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ROCKETS AND MISSILES

Academy Report Stresses Need for Space Probes

SATELLITES and space probes may some day enable man to learn more about the origin and history of the solar system, the Space Science Board of the National Academy of Sciences reported. Dr. Harold C. Urey, Nobel Prize winner from the University of California at La Jolla, prepared that part of the report concerning the moon and planets, summarizing current views and noting areas of uncertainty and controversy as well as facts that seem to be well established.

Among experiments suggested in the report are the televising of the moon's surface as seen through a microscope, testing of the surface for magnetic substances, hardness and depth studies by means of probes, seismic observations, temperature measurements, and chemical and spectroscopic analysis of surface rocks.

Dr. Urey recommends that the first man to go to the moon be trained primarily in geology, but that he also have a considerable knowledge of several other sciences.

The report also suggests that efforts be made to land instruments for chemical analysis and seismic observations on the cold side of Mercury.

The complete report, entitled "Science in Space," will consist of nine chapters. Forthcoming chapters are "Physics of Fields and Energetic Particles in Space," "The Nature of Gravitation," "The Earth," "The Sun," "The Biological Sciences and Space Research," "Galactic and Extra-galactic Astronomy," and "A General Review."

Purpose of the report is two-fold: to review areas and opportunities for important research studies using space vehicles, and to suggest what now appear to be major areas of emphasis for the national space effort.

Science News Letter, April 9, 1960

Questions

GENERAL SCIENCE—What is the factor that causes the paper of books to deteriorate? p. 232.

MEDICINE—What type of cancer are workers in the asbestos industry likely to develop? p. 227.

PUBLIC HEALTH—Why is spraying the houses in part of Brazil largely ineffective against mosquitoes carrying malaria? p. 234.

ROCKETS AND MISSILES—How many pounds of helium would be needed to blanket a typical, manned space vehicle? p. 230.

Photographs: Cover, Princeton University; p. 227, Westinghouse Electric Corporation; p. 229, National Aeronautics and Space Administration; p. 231, General Instrument Corporation; p. 234, Pan American Health Organization; p. 240, Eastman Chemical Products, Inc.

Kodak reports on:

. . . sunshine for the plastics man who worries . . . a little literature before the 11 o'clock news

Infrared detectors for sale

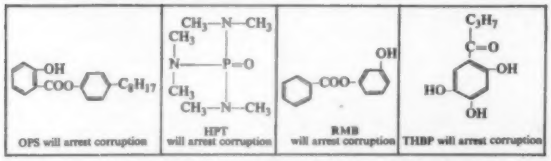
Our involvement in infrared detectors has deepened.

Pictured at the top of this page are, respectively, the simplest kind of *Kodak Ektron Detector* with a rectangular sensitive area of any reasonable dimensions, available either in a 3-pin miniature cable socket or unmounted with resolderable leads; an "immersed" detector with detecting substance deposited on the plano surface of a radiation-collecting lens; a detector mounted in a Dewar for cooling by cryostat. We also deposit detecting substance in separated or intricate configurations as ingenuity, under necessity's goad, may provide.

Since any of these physical forms can now be provided with any of six different kinds of lead sulfide or lead selenide depositions, as governed by spectral sensitivity, response time, temperature, and ambient humidity, the print gets quite fine in a folder we are publishing this month to guide the selection of *Kodak Ektron Detectors.*

A free copy is available from Eastman Kodak Company, Apparatus and Optical Division, Rochester 4, N. Y. It is designed to make the sale with minimum further correspondence. To give you an idea, the off-the-shelf, one-only price scale starts from $14.50.

Corruption can be arrested



"You" are assumed to be a producer of compounds for molding or extrusion. This message is strictly private between you and us. As far as your customers, the molders and extruders, will ever know, the reason why your vinyls, cellulosics, polyesters, or polyolefins stand up so well to weathering is the integrity of your name. And as far as *their* customers will ever know, it is *their* integrity that explains why so little cracking, crazing, embrittlement, gumming, or discoloration with the passage of time and sunshine.

The concept of integrity is more readily grasped than is the principle that every C-C bond, every O-H bond, every C-Cl bond, every C=N bond, has its own price—a photon of ultraviolet radiation just right in energy to snap it. Thus corruption of plastics, a chain reaction like other corruptions, begins. A rival substance that grabs off the u-v photons first and degrades their energy will delay the corruption for a long time.

Other corruptions, initiated by atmospheric oxygen, can be delayed by compounds that stop the action by supplying hydrogen at a critical juncture. Of course, choice in inhibitors is greatly restricted by many considerations of physical and chemical compatibility.

Obviously, we think we have made a good choice in these new ones:

Eastman Inhibitor OPS (p-Octylphenyl Salicylate), at 1 to 5% levels, a preventive of the photo-oxidation that forms deleterious carbonyl groups in polyethylene and polypropylene.

Eastman Inhibitor HPT (Hexamethylphosphoric Triamide), very pale, water-soluble, a liquid u-v inhibitor for use with a heat stabilizer in poly(vinyl chloride) at 1 to 2%.

Eastman Inhibitor RMB (Resorcinol Monobenzoate), a non-coloring u-v inhibitor at 1% levels for transparent cellulose acetate butyrate. Superior to phenyl salicylate. Also protects cellulose acetate, cellulose acetate propionate, polystyrene, poly(vinyl chloride), and ethylcellulose.

Eastman Inhibitor THBP (2,4,5-Trihydroxybutyrophenone), an antioxidant for polyolefins and various paraffin waxes. May be added in solid form directly during the milling process, or in solvent solutions to dry powders or melts, at 0.01 to 0.1% concentrations. Especially valuable for absence of stain at the low concentrations.

Isn't it fun how in the chemical industry practically everybody is simultaneously practically everybody else's customer, supplier, and competitor! Data sheets and development samples (for those in a position to evaluate them) from Eastman Chemical Products, Inc., Kingsport, Tenn. (Subsidiary of Eastman Kodak Company).

Metallography and other matters

You would think we had nothing better to do than write letters and be friendly, helpful, and cheerful.

Though this policy hasn't sunk us yet, we do go through motions to put the dispensing of technical photographic wisdom on a slightly self-sustaining basis. For those who have not yet delved deep enough to frame specific questions, we publish what we call *Kodak Data Books* and print on the cover a small cash price, like 50¢.

Just issued is a new one, "Photomicrography of Metals." It contains 13 pages on the metallographic microscope (unbiased toward any particular make of instrument, since we are not in that business), 3 pages on illumination, 5 on filters, 3 on photographic materials (which we do make), 5 on exposure determination, and 8 on processing and printing—just enough for thoughtful perusal between the evening paper and the 11 o'clock news. The pages are meaty; the illustrations are there to explain, not just fill space; the author (anonymous) is a photomicrographer, not an ad-writing hack.

Also just published is the 8th edition of one that has taught many thousands of people since 1933 the rock-bottom facts about the photographic emulsion as a scientific device. The title, "Kodak Photographic Films & Plates for Scientific and Technical Use," dissembles a wee bit. In the old days astronomy was regarded as too thin and unworldly a market to justify commercial literature; therefore the title was devised as a shield from the beady eyes of hard-headed accountants. They find it hard to understand that addressing ourselves to the needs of men with their minds inside stars strengthens the capabilities of photographic technology in general. Indeed, this new 8th edition contains some helpful hints from Mount Wilson and Palomar Observatories that could teach an amateur astronomer to think like a pro. The edition reveals some constriction from the sprawling diversity of *Kodak "Spectroscopic" Plates and Films* hitherto offered, and these pages show how the present lineup fills the bill.

Theoretically the purchase of these data books from your Kodak dealer draws him and you closer together. Those willing to forego the personal touch can obtain them from Special Sensitized Products Division, Eastman Kodak Company, Rochester 4, N. Y., which is also the place to address specific questions.

Price quoted is subject to change without notice.

Kodak
TRADE MARK

This is another advertisement where Eastman Kodak Company probes at random for mutual interests and occasionally a little revenue from those whose work has something to do with science

New Machines and Gadgets

For sources of more information on new things described, send a self-addressed stamped envelope to SCIENCE NEWS LETTER, 1719 N St., N.W., Washington 6, D. C., and ask for Gadget Bulletin 1034. To receive this Gadget Bulletin without special request each week, remit $1.50 for one year's subscription.

MINIATURE RADIO picks up both standard and shortwave signals yet is just 6 inches wide, 3½ inches high and less than 2 inches deep. The transistorized radio has a private earphone and a jack for an external speaker (not furnished). A companion model receives standard broadcasts and marine shortwave.

Science News Letter, April 9, 1960

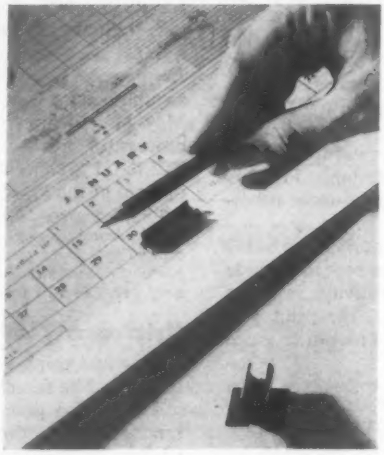
PLASTIC FILLER is designed for quick, low-cost repairs on dents, holes and rusted out areas of automobile bodies. Primarily for professional shop use, the putty-like compound turns hard with the addition of a setting agent. Then it can be sanded, drilled, tooled, picked and painted.

Science News Letter, April 9, 1960

PUNCH-CARD "KEY" system watches the door of key clubs and other exclusive organizations. Members in good standing get cards that, when inserted in a slot at the club entrance, open the door. Non-members are automatically barred.

Science News Letter, April 9, 1960

VISOR PAL CALENDAR is a special-purpose calendar, seen in the photograph, that wraps around a car's sun visor and provides a quick means of keeping records on servicing expenditures and dates. A



bright plastic clip, with resilient cradling arms for holding a pencil or pen ready for use, is locked snugly to the calendar by means of a slot.

Science News Letter, April 9, 1960

ALUMINUM SOLDER repairs cooking utensils, aluminum or galvanized gutters or walls, cracked automobile grilles and many other hard-to-fix items. The fluxless solder is manufactured in stick form for easy use.

Science News Letter, April 9, 1960

POCKET RECEIVER, a transistorized, high-powered radio, permits a central desk to page or instruct employees carrying the device. Weighing just over ten ounces, the receiver may be slipped into a pocket or clipped on a belt. It will operate 12½ hours on a rechargeable battery or up to 125 hours on mercury cells. For distant communications, a trouser-leg antenna is available.

Science News Letter, April 9, 1960

SELF-POWERED SHAVER can store enough energy in its rechargeable battery for up to three weeks of electric shaving. Then the charging device may be recharged by plugging it into AC voltage from 90 to 250 volts. The shaver also features roller combs that adjust to various beards and skins.

Science News Letter, April 9, 1960

VINYL TUBING, for laboratories, handles a wide variety of chemicals. Its smooth interior minimizes the accumulation of minute particles which might contaminate chemical solutions. The tubing is clear, soft and flexible.

Science News Letter, April 9, 1960

Nature Ramblings

IN EARLY SPRING, the abundant pink flowers of the redbud light up dry, rich woods over the greater part of eastern United States.

The redbud is a small tree, sometimes in forest growth reaching a height of 40 to 50 feet but, when isolated, seldom attaining so great a height and developing a low, wide, flat-topped or rounded head.

Blooming at the same time of the year as the flowering dogwood, the redbud inhabits the banks of ravines and rich bottomlands from Florida to Texas and north to New York, Wisconsin and Iowa. Although its scientific name, *Cercis canadensis*, would seem to indicate that it is a native of Canada, it is rarely found that far north.

All through the Ohio River country, and south of it, the redbud is as abundant as the wild cherry is in the north. No other tree produces a flower of anything like its color and, when in bloom, few indeed exceed its conspicuousness on the landscape.

The Blushing Redbud

The flowers appear in March and April, before its leaves, and have cup-like, deep purple calyxes and rose-colored corollas. The stamens and pistils are enclosed and hidden by the lower petals. By midsummer the pistil has developed into a flat legume of much the same color as the petals of the flower, but later turns brown. It remains on the tree until fall or early winter.

The redbud's trunk, clothed in a grayish or reddish brown scaly bark, is of hard, heavy, close-grained wood that has little commercial value.

It is indeed fortunate that this dainty tree brings forth its blossoms before its leaves. For it would defeat its own beauty if it waited for the leaves to grow before flowering. The flowers, though numerous, are not large and would be wholly hidden under the heart-shaped, dark green leaves that later cover the tree.

Less fortunate is the name by which the redbud is often called—Judas tree—which was the ancient name of the oriental species. Legend has it that the redbud was the tree from which Judas Iscariot hanged himself and that the blossoms have ever since blushed with shame.

Be it from shame or blushing innocence, the flowering loveliness of the redbud brightens the countryside of even the cloudiest spring day.

Science News Letter, April 9, 1960